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THE PLANT DISEASE REPORTER

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THE OFFICE OF MYCOLOGY AND DISEASE SURVEY

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The Plant Disease Reporter is being issued somewhat earlier this year than usual on account of the fact that considerable data are being received by the Plant Disease Survey now which if made available at once to pathologists may be helpful to them in their immediate work. Readers of this news sheet are requested to send in notes for future numbers which will be forthcoming semi-monthly from now on.

The present issue deals largely with the apple scab situation. It seems that the ejection of ascospores of the scab fungus is occurring somewhat earlier than usual, not only earlier in the season but also earlier in comparison with the stage of the apple tree itself. It would appear therefore that the earlier sprays such as the pink and possibly the delayed dormant may prove to be of especial importance at least in some cases this year.

The article by Jehle and Hunter which follows is a significant one. In spite of the comparative scarcity of scab lesions on the leaves last year the old leaves on the ground this spring are showing many perithecia. They have evidence that the fungus has spread saprophytically in the old foliage or at least in some way has increased greatly in it since last fall resulting in an abundance of inoculum.

OBSERVATIONS ON THE DEVELOPMENT OF THE PERITHECIA OF VENTURIA INEQUALIS (CKE.) WINT. IN MARYLAND

By

R. A. Jehle and H. A. Hunter

In order to determine the correct time for the application of the first apple scab spray, scabby leaves were collected in various parts of the state and the development of the perithecia was studied. In most of the sprayed orchards there was practically no scab on the leaves last year, and it was almost impossible to find any scab lesions on the old leaves even under the most susceptible varieties such as Stayman Winesap, Winesap, Black Twig, and Delicious. However, a great abundance of bodies, which appeared to be identical with the perithecia on leaves with scab lesions, were found upon practically every leaf. Leaves containing these bodies, but showing no scab lesions, were placed under moist chambers and the bodies were forced to maturity. The measurements of the perithecia, asci, and ascospores were identical with those found on leaves with scab lesions. Later, when the perithecia matured in the open, many leaves in a large number of orchards located in various parts of the state were examined and practically no leaves were found upon which at least a few perithecia could not be found, and most of them contained them in abundance. With but few exceptions, all of the perithecia when crushed contained asci and ascospores which could not be distinguished from those occurring on leaves with scab lesions. Many of those orchards were known to have had practically no scab on the leaves or fruit last year.

It thus seems that after the leaves dropped in the fall, the scab fungus invaded not only the surrounding tissue of the leaf upon which it occurred, but also the tissue of many other leaves. Since the leaves usually form a mat on the ground this would easily be possible.

The first discharge of apple scab ascospores occurred on leaves collected in Charles and Caroline Counties, which reached the University of Maryland on April 5. In Charles County the trees were in the pre-pink stage at this time, and in Caroline County they were only a little past the delayed dormant stage. In the southern Maryland counties and in the southern Eastern Shore Counties, spraying in the pre-pink stage was recommended.

DATES OF ASCOSPORE MATURITY (IN CAPITALS) AND EJECTION (IN SMALL LETTERS), AS RECORDED IN THE PLANT DISEASE SURVEY FILES, 1925 TO 1927, INCLUSIVE.

	1925	1926	1927
Orono, Maine	MAY 8	----	MARCH 19, April 22
Highmoor Farm, Maine	MAY 12	----	APRIL 17
Dutchess County, New York	----	MAY 9	APRIL 9
Ithaca, New York	----	MAY 10	APRIL 15

	1925	1926	1927
New Brunswick, New Jersey	April 28	April 28	APRIL 4
State College, Pennsylvania	April 21	----	April 21
Maryland	----	APRIL 28	April 5
Winchester, Virginia	April 10	April 8	March 31
Urbana, Illinois	EARLY IN APRIL	----	MARCH 19, March 20
Madison, Wisconsin	----	----	MARCH 11, April 5
Sturgeon Bay, Wisconsin	APRIL 26	----	APRIL 3, April 14

Note: We would appreciate your help in making the above table more complete both with regard to dates and to other localities.

STATE REPORTS ON THE APPLE SCAB SITUATION

Maine: On March 19, mature ascospores were found in 15 per cent of apple leaves collected in an abandoned, unsprayed McIntosh nursery at Orono. At this time there was no indication of the buds bursting. On April 11, 22 per cent of a leaf collection had developed mature ascospores. The snow melted early this year and warm weather prevailed during the first part of March. Probably no natural ejection of ascospores occurred previous to April 22, because of lack of rain up to that time.

Forty-five Ben Davis leaves collected at Highmoor Farm, Monmouth, on April 6 were examined April 7. This revealed no mature ascospores and one leaf contained immature ascospores. Subsequent collections made here April 17 to 21 contained mature ascospores in 0-2 per cent and immature in 2-5 per cent. The snow remained longer here than at Orono, which may have retarded the development of the ascospores. (Ayers & Folsom, April 23)

New York: As previously reported mature ascospores were found in dead leaves collected in Dutchess County April 9. Sufficient inoculum is undoubtedly present for infection during the next rain period in the Hudson Valley.

Mature ascospores were found in dead leaves at Ithaca April 15. The numbers of mature perithecia on leaves at Ithaca was still small due to the exceptionally dry weather but sufficient inoculum is present for serious amount of infections if rain periods of sufficient length follow. This is probably also true of western New York although collections of leaves have not yet been made there.

As only a very little foliage is exposed at the delayed

dormant stage only a relatively small portion has a protective cover by the time the pre-blossom spray is applied. For this reason the pre-blossom time is a very critical period for the special field assistant and the weather and bud development must be closely followed to be able to give adequate warning to the growers. Two sprays may be advisable between the delayed dormant and the calyx but in most seasons one spray well timed - that is just before the rain periods - will give good control. (New York Sta. Col. Week. News Letter, April 18, 1927)

APPLE SCAB SITUATION

New Jersey: Ascospore discharge studies have been conducted by the Department of Plant Pathology the past three years. The following table shows the dates on which mature ascospores were first observed as well as dates of first discharge.

Year	Mature spores observed	First discharge
1925	April 15 Cumberland Co.	April 25 Moorestown
1926	April 19 Atlantic Co.	April 28 New Brunswick
1927	March 23 Atlantic Co.	April 9-10 Bridgeton

It will be observed from this table that the ascospores of the apple scab fungus matured at a much earlier date this year than in either 1925 and 1926.

It is clear from the New Jersey observations that in the South Jersey counties the delayed dormant application was of importance this year from the standpoint of time of maturity of the ascospores. Fortunately, the weather has not been such the past two weeks as to encourage the development of scab. It should be noted, however, the snow storm at Bridgeton on April 9, while not heavy, was evidently sufficient to result in a discharge of spores.

In some sections it is probably true that the omission of the delayed dormant will not result in a severe outbreak of scab this year. This is not the fault of the scab spores, however - they were present and rarin' to go - we were fortunate enough to have weather not particularly favorable to scab. Had we had cool wet conditions the past two weeks there would be an entirely different story to relate.

In the meantime, it is important that we stress the fact to the growers in the southern counties that the scab spores are mature, that they are present in great abundance and that this dry weather cannot continue forever. It is very important then that the pink spray be applied at once using concentrated lime sulfur. In the northern counties it would appear particularly advisable that a delayed dormant application be made. If this is not done, it may be necessary later to make a pre-pink and pink application in order to successfully cope with scab. (Plant Disease Notes 5 (1): 1-5. Apr. 1927)

Pennsylvania: I have been following the apple scab situation here at State College and find that we had the first discharge of ascospores on April 21, although from examination these spores had been mature for at least a week at that time. Scabby leaves were very scarce in our orchards here although perithecia were abundant enough on scabby leaves. (Thurston, April 25)

Virginia (Arlington Farm): Dr. J. W. Roberts collected leaves showing initial scab infection April 23. (Haskell)

Illinois: We have had almost continuous rains since the last of March and the situation looks discouraging from the standpoint of control of fruit diseases.

I found the first apple scab at Urbana on a crabapple variety on the 16th of this month. I think this establishes the record for the early appearance of apple scab in this state. At this time a few of the flowers were opening although most of the apple varieties are in the early pink stage. This crabapple tree is the same one under which I found ascospores discharging as early as March 20. The leaves on this crabapple tree appeared unusually early and no doubt this accounts for the very early infection. (H. W. Anderson, April 19)

Wisconsin: In connection with our work here at Sturgeon Bay we have made observations on the perfect stage. We have also made a detailed study at Madison.

The first mature ascospores were found at Madison on March 11. The perithecia were numerous especially on certain varieties. The first discharge was not recorded until April 5.

Leaves were collected at Sturgeon Bay on April 3 and numerous erumpent perithecia were present. Mature spores were also found but no discharge was obtained at this time. The next observation was not made at Sturgeon Bay until April 14 when mature ascospores were found and a light discharge was obtained. Since then discharges of significance have accompanied the frequent rains. Perithecia are numerous in leaves which were not sprayed last year but are less abundant in orchards which were sprayed. The buds on the earliest varieties were beginning to open at the time of the first discharge but no susceptible parts were exposed. (Wilson, April 23)

Oregon: The beginning of ascospore discharge occurs so early under Oregon conditions that spores are in the air every rainy spell long before the winter buds on the trees begin to break. No check is made as a rule on the date of earliest spore maturity. Desiring some cultures the other day (about April 15) leaves were obtained and spores were discharged at once. Apples are mostly two weeks from bloom yet. (Barss, April 23)

NOTES ON THE BROWN ROT OF STONE FRUITS

Indiana: It may be of interest to you to know that brown rot apothecia were noted in an orchard in the Vincennes section this spring on March 22. The date of their first appearance in the same orchard in 1926 was April 14. (Pierce, April 2)

Illinois: I found brown rot developing on the shucks of peaches in southern Illinois and in some cases the fungus had penetrated the young peaches. We do not ordinarily apply a fungicide before the bloom as is done in the East, since we have rarely found blossom blight occurring in this section. This would have been a good practice this year. I don't know just how much damage will be done by brown rot at this stage but unless the weather clears soon there will be a heavy drop as a result of this early infection. (H. W. Anderson, April 19)

PEACH LEAF CURL

Illinois: You may be interested in knowing the peach leaf curl situation in this state. I have just returned from an extensive trip through the peach-growing section. Leaf curl is again generally prevalent throughout the entire southern portion of the state. It became evident about ten days ago, that is about April 10, in Union and Johnson Counties. Many of the unsprayed orchards are so heavily infected that they appear yellow from a distance. In several such orchards I would say that 90 per cent of the leaves showed the disease.

Dormant sprays of lime sulfur and of oil emulsion-copper sulfate (4 pounds copper sulfate to 50 gallons oil emulsion) have, in practically all cases, controlled the disease, while oil emulsion-Bordeaux has given only moderate control. Oil emulsion alone has not given control. The unusually wet and somewhat cool weather which has prevailed over this section of the country since the middle of March is no doubt responsible for the leaf curl situation. This is the second year when the weather has been extremely favorable for the development of this disease. (H. W. Anderson, April 19)

FROST DAMAGE TO FRUIT IN ILLINOIS

"You may be interested in knowing the results of the frost damage in this state to fruit. The apple crop was hit hardest, perhaps because it was the big money crop of the state. Temperatures were as low or lower in southern Illinois as in the central part of the state. For example, on the night of April 21 the temperature at Urbana was 29 degrees, while at Centralia and Anna it was 28 degrees. The apples at this time in the extreme southern part of the state had received the calyx spray, while at Centralia

about nine-tenths of all the petals had fallen and at Urbana they were just beginning to bloom. Practically the entire crop was wiped out either by these frosts or by a failure to set, due to excessive rainy periods preceding the frosts. In other words, I am of the opinion that there is a reduction of 90 per cent in the apple crop of the state due to light set and the frosts. We had promise of a heavy crop throughout the state at the time of bloom.

"Peaches had slipped the shucks in Union and Johnson Counties in southern Illinois and were just starting to slip the shucks in central Illinois. The shuck applications had been made in most orchards in southern Illinois at the time of the frosts. Apparently not a great deal of damage was done to peaches in most sections of the state except in low places. I would judge that the actual loss from the frosts will not be over 25 per cant on the peaches.

"Grapes were killed generally throughout the state as far north as Urbana, but grapes have a habit of coming back with another set of bloom. Strawberries which were blooming in the south central section of the state were wiped out entirely and so far as I know have been killed throughout the southern half of the state. I believe that this is the most disastrous series of frosts which we have had for at least ten years." (H. W. Anderson, April 26)